

## Appendix R

### Aircraft Crash Accident at Pantex Plant

Aircraft accidents are a concern at Pantex Plant (Pantex) because of the large volume of local air traffic, the proximity of Pantex to flight paths to and from the Amarillo International Airport, and overflights. Pantex is a unique Department of Energy (DOE) facility because the location of nuclear weapons and weapon components, Zone 4 West, is situated on a direct line off the centerline of Runway 04/22. The airport is used by commercial air carriers and air taxis, large and small military aircraft flying touch and go training exercises, and general aviation aircraft. Even though the likelihood of an aircraft crash at Pantex is small, a crash could have the potential of causing radioactive releases from Pantex facilities.

In the past, the aircraft crash analysis was done using the Solomon model, which is over 20 years old. However, this method has been determined to be obsolete because it does not consider aircraft altitude in the model, does not incorporate recent data for crashes that occur near airports in the United States, and does not account for recent changes for aircraft that do not fly on designated airways. DOE has created a new set of models that replace the Solomon model. This DOE standard, *Accident Analysis for Aircraft Crash Into Hazardous Facilities*, was used to estimate the aircraft impacts in the *Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components* (Pantex EIS).

The Pantex EIS analyzed the probability of hitting those nuclear facilities where plutonium (Pu), highly enriched uranium (HEU), and tritium are located. This analysis separated the 60 storage magazines in Zone 4 West from the nuclear facilities in Zone 12 South, where nuclear operations occur. The probability of an aircraft hitting a facility in Zone 4 or Zone 12 is  $1.3 \times 10^{-5}$  and  $1.8 \times 10^{-5}$ , respectively, for a total probability of  $3.1 \times 10^{-5}$ . The likelihood of an aircraft hitting a Zone 12 South nuclear facility is slightly greater than that of an aircraft hitting a Zone 4 West magazine, primarily because the total Zone 12 South target footprint is slightly larger than that of Zone 4 West.

After determining the probability of an aircraft crashing into a facility, the potential for sufficient building damage to cause a release was then determined. For an aircraft impact, building damage is defined as perforation (when a missile [flying object] generated by an aircraft penetrates into a facility) or scabbing (when an impact of an aircraft missile on a facility generates a secondary missile inside the facility). For magazines or building containing pits not in weapons, the only release mechanism possible is a perforation followed by a fire from spilled aircraft fuel. The Pantex EIS assumed that a perforation would lead to a release. This assumption is conservative for several reasons: 1) a fire may not occur, 2) the magazine contents may not be involved in the fire if the fuel material does not get into the facility, and 3) pits are currently stored in AL-R8 containers, which provide thermal and impact resistance. For Zone 4 and Zone 12 where Pu, HEU, and tritium are stored, the probability of facility perforation leading to a fire is  $5.3 \times 10^{-7}$  and  $4.7 \times 10^{-7}$ , respectively, for a total of  $9.9 \times 10^{-7}$ .

If any of the three storage alternatives (upgrade, consolidate, or collocate) of the *Storage and Disposition of Weapons-Usable Fissile Materials Programmatic Impact Statement* (Storage and Disposition PEIS) were implemented, there would be a change in the aircraft crash probability. These alternatives would transport Pu material from other existing Pu storage sites, including Rocky Flats Environmental Technology Site (RFETS). Since the result of any of these alternatives would be the removal of all Pu pits not in weapons from Zone 4, aircraft crash and release probabilities would be reduced. If either the Preferred Alternative (Upgrade With RFETS Pu Pits Subalternative) or the Upgrade With All or Some RFETS Pu and Los Alamos National Laboratory Pu Subalternative is selected, all Pu would be moved to existing buildings in 12-66 and 12-82. This would reduce the aircraft crash and release probabilities almost proportionally to the number of Zone 4 West magazines no longer used. The aircraft crash and release probabilities in Zone 4 would only be for those magazines where nuclear weapons are staged. The impact of additional Pu in Zone 12 South buildings would

be minimal because Buildings 12-66 and 12-82 are existing and adjacent to where Pu is currently stored. Therefore, the aircraft crash probability would be approximately the same.

The Consolidation Alternative to the Storage and Disposition PEIS has two options at Pantex: 1) build a new facility and modify existing facilities in Zone 12 South or 2) build a new facility in Zone 12 South. Under the first option, there would be a reduction in the aircraft crash and release probabilities due to a reduction in target footprint in Zone 4 and a minimal increase in Zone 12 South as discussed for the Upgrade Alternative. The new facility in Zone 12 South would have a smaller target footprint compared to the Zone 4 West pit storage magazines no longer used. There would be an increase in the aircraft crash and release probabilities because of the addition of a new facility in Zone 12 South and a decrease because of the closing of some magazines in Zone 4 West. Because the overall Pantex footprint would decrease, the overall aircraft accident probabilities for all of Pantex would be reduced. The impacts from the second consolidation option, building a new facility, or the Collocation Alternative, would be similar to the first consolidation option since material would be moved from Zone 4 West to Zone 12 South.

Pantex is a potential site for locating two disposition facilities - pit disassembly/conversion and mixed oxide (MOX) fuel fabrication. Should new facilities be built at Pantex, there would be an increase in the aircraft crash and release probabilities depending on locations. If existing buildings where Pu operations are currently occurring were used, there would be no increase in the aircraft crash and release probabilities. The aircraft crash and release probabilities are highly dependent on the size of the building (target footprint) and the location of the building (whether or not it is shielded by other buildings). Based on the current size and location of the buildings, for the Preferred Alternative, if either the pit disassembly/conversion facility or MOX fuel fabrication facility were built at Pantex, either building would increase by no more than 10 percent of the current Zone 12 crash probability,  $1.8 \times 10^{-5}$ , or release probability,  $4.7 \times 10^{-7}$ . The crash and release probabilities for either building would be assessed in subsequent, tiered *National Environmental Policy Act* review.